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EXAMINER

WANG, QUAN ZHEN

ART UNIT PAPER NUMBER

2633

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/966,866

Applicant(s)

PEETERS ET AL.

Examiner

Wang Quan-Zhen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Drawings***

1. The drawings are objected to because the blocks in fig. 1 do not correspond to conventional symbols used in the art, therefore, descriptive labels or legends for those blocks in fig. 1 are needed. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because "means" should be avoided in the abstract. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

3. Claims 12 and 23 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding claim 12, it recites: "An optical link according to claim1 wherein the series of spans are not normalizes ...". However, claim1 sets the limitation that "an optical link ... comprising a series of normalized spans ...and the total noise in the link is the sum of the contributions from each span ...". The

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limitation set in claim 12 fails to further limit the subject matter of the previous claim 1 that it depends on.

Regarding claim 23, it recites: "A method according to claim 22 wherein the series of spans are not normalizes ...". However, claim 22 sets the limitation that "A method of ... in a link ... having a series of normalized spans ... and the total noise in the link is the sum of the contributions from each span ...". The limitation set in claim 23 fails to further limit the subject matter of the previous claim 22 that it depends on.

#### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12 and 23 provides for the use of "the series of spans are not normalizes", but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

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***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7-11, 13-15, 17-22, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Essiambre et al. (U.S. Patent 6,606,176 B1).

Regarding claims 1, 4, 13, 17, 22, and 24 Essiambre et al. teach an optical link from one terminal (fig. 1, TX and POST-AMPLIFIER) to another (fig. 1, RX and PRE-AMPLIFIER), comprising a series of normalized spans (the power map in fig. 2 indicates the spans have unity gain) interconnecting nodes between the terminals, dispersion compensation means (fig. 1 DISP-COMP FIBER) applying dispersion compensation to each span. Each span intrinsically contributes noise to the link system. The amount of dispersion applied to each mid-span by the dispersion compensation means is determined by the span length (dispersion map in fig. 2, column 5, lines 38-39, lines 43-45), inherently determined in accordance with the noise contribution of that span since it is an intrinsic property that “the noise in any span is related to the losses in that span” (page 2, line 16 of the present application).

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Regarding claims 2 and 3, there is a defined allowable noise level for any system. When a system is disclosed, it implies that the accumulative noise from all of the spans in that system should be smaller than the maximum allowable noise for the system in order for the system to function properly.

Regarding claim 5, the optimum rule of operation of a system depends on many system parameters, Essiambre et al. disclose the optimum performance conditions for various systems in figs. 4-9.

Regarding claims 7-8, 14-15, and 21, Essiambre et al. disclose the dispersion compensation using a series DCF (fig. 1, DISP-COMP FIBER) modules located at a series of amplifiers (nodes) (fig. 1, IN-LINE AMPLIFIER) to provide dispersion compensation. The compensation can be viewed as to pre-compensate next span or post-compensate the previous span.

Regarding claims 9-11, Essiambre et al. disclose a series of amplifiers (fig. 1, IN-LINE AMPLIFIER) normalized for each span (fig. 2). The amplifier at a node can be viewed as to pre-amplify the signal for next span or post-amplify the previous span.

Regarding claims 18-21, Essiambre et al. teach an optical communication network comprising a link from one terminal (fig. 1, TX) to another (fig. 1, RX), comprising a series of normalized spans (the power map in fig. 2 indicates the spans have unity gain) interconnecting nodes between the terminals, dispersion compensation means (fig. 1, DISP-COMP FIBER) applying dispersion compensation to each span.

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***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Essiambre et al..

Regarding claim 6, Essiambre et al. teach to compensate dispersion in each span locally (dispersion map in Fig. 2). Essiambre et al. does not specifically teach the formula to calculate the length of the dispersion compensation fibers as claimed. However, examiner takes office note that it is well known in the art that the cumulative dispersion is the integrated dispersion (dispersion\*distance). That implies that span dispersion is equal to (dispersion\*span-distance). The dispersion compensation for each span is thus inherently defined as

optimum-dispersion\*(span-distance)/distance.

That is equivalent to the relationship given by the applicants in claim 6.

Therefore, it would have been obvious for one ordinary skill in the art at the time when the invention was made to derive the claimed formula to calculate the length of dispersion fibers for each span in order to accurately compensate the dispersion induce in that span.



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Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Essiambre et al. in view of Park et al. (U.S. Patent Application Publication US 2003/0058497 A1).

Regarding claim 16, Essiambre et al. teach a dispersion compensation mean applying to optical fiber span to provide dispersion compensation. Essiambre et al. further teach to use optical dispersion compensating fiber module for the dispersion compensation mean. Essiambre et al. do not specifically teach to use at least one of fiber grating, virtually imaged phase array MEMS etalon, and cascaded Mach Zehnder for the dispersion mean, as claimed by the applicants. However, Park et al. (U.S. Patent Application Publication US 2003/0058497 A1) teach to use virtually imaged phase array (VIPA) or a fiber Bragg grating for dispersion compensation (Page 4, 0044). It would have been obvious for one ordinary skill in the art at the time when the invention was made to replace the optical fiber dispersion compensation module in the system taught by Essiambre et al. by virtually imaged phase array (VIPA) or a fiber Bragg grating for dispersion compensation taught by Park et al. to build more flexible and cost-effective systems without changing the fundamental novel features of the invention by Essiambre et al..

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Essiambre (U.S. Patent 6,583,907 B1) discloses an optical communication system utilizing dispersion compensation.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (703) 305-8392. The examiner can normally be reached on 8:30 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan Jason can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw

  
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